



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO.                | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--------------------------------|-------------|----------------------|---------------------|------------------|
| 10/037,179                     | 10/23/2001  | Alan Gatherer        | TI-31552            | 6358             |
| 23494                          | 7590        | 05/18/2005           | EXAMINER            |                  |
| TEXAS INSTRUMENTS INCORPORATED |             |                      | PATHAK, SUDHANSHU C |                  |
| P O BOX 655474, M/S 3999       |             |                      | ART UNIT            |                  |
| DALLAS, TX 75265               |             |                      | PAPER NUMBER        |                  |

2634

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                   |                                 |  |
|------------------------------|-----------------------------------|---------------------------------|--|
| <b>Office Action Summary</b> | Application No. <u>10/037,179</u> | Applicant(s)<br>GATHERER ET AL. |  |
|                              | Examiner<br>Sudhanshu C. Pathak   | Art Unit<br>2634                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on October 23<sup>rd</sup>, 2001.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-17 is/are allowed.
- 6) ☒ Claim(s) 18-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on March 4<sup>th</sup>, 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                            | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

### DETAILED ACTION

1. Claims 1-to-20 are pending in the application.

#### *Information Disclosure Statement*

2. The information disclosure statement filed on October 23<sup>rd</sup>, 2001 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. The above specified IDS discloses a reference that does not exist i.e. (X. Li and J. A. Ritcey, "Bit-interleaved coded modulation with iterative decoding using soft feedback" Electronic Letters, vol 34, pp. 169- 171, 4 March 1998). **The reference should actually be (X. Li and J. A. Ritcey, "Bit-interleaved coded modulation with iterative decoding using soft feedback" Electronic Letters, vol 34, No. 10; pp. 942-943; 14<sup>th</sup>, May 1998).**
3. Furthermore, **the copy actually enclosed with the IDS listing is (X. Li and J. A. Ritcey, "Bit-interleaved coded modulation with iterative decoding" IEEE Communications Letters; Vol. 1, No. 6; Pages 169-171; November 1997) is not listed in the IDS listing (PTO-1449).**

#### *Specification*

4. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature

of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

5. The disclosure is objected to because of the following informalities:  
The Specification on Page 1, line 7 refers to ".....U.S. Serial No. ...."  
However, no serial number is provided.  
Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant Admitted Prior Art (AAPA) in view of Li et al. (Bit-Interleaved Coded Modulation with Iterative Decoding; IEEE Communications Letters; Nov. 1997; Pages 169-171).

Regarding to Claims 18-20, the Applicant Admitted Prior Art (AAPA) discloses a wireless communications transmitter apparatus comprising an input for receiving a bit stream (Fig. 1, element 11 & Specification, Page 2, lines 16-21); a coder coupled to said input for performing a coding operation on said bit stream, said coder having an output for providing a result of said coding operation (Fig. 1, element 16); a first

modulator coupled to said coder output for modulating said result, and a first antenna coupled to said first modulator for transmitting said modulated result on a wireless communication channel (Fig. 1, elements 11,  $\alpha$  & Specification, Page 2, lines 15-22); an interleaver coupled to said coder output for producing an interleaved version of said result (Fig. 2, element 21); and a second modulator coupled to said interleaver for modulating said interleaved version, and a second antenna coupled to said second modulator for transmitting said modulated interleaved version on a wireless communication channel (Fig. 1 & Fig. 2). The AAPA further discloses the coder to be a convolutional coder and the first and second modulators to be QPSK modulators (Specification, Page 2, lines 15-22). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that the AAPA in Fig. 1 teaches a transmitter comprising a coder for coding an input bit stream, a first and second modulator for modulating the coded stream and an interleaved version of the bit stream respectively, and a first and second antenna for transmitting the respective modulated signals over a wireless communications channel. Fig. 1 teaches interleaving the input bit stream before encoding. However, the AAPA further in Fig. 2 teaches a single path transmitter wherein the function of the interleaving is performed after the encoding, therefore there is no criticality in interleaving before the encoding or after the encoding process this is a matter of design choice, thus satisfying the limitations of the claim.

***Allowable Subject Matter***

8. Claims 1-17 are allowable over the prior art of record because the cited references do not contain the specified limitation of a wireless communication receiving apparatus (method), comprising: an antenna for receiving via first and second wireless communication channels a composite communication symbol that represents first and second communication symbols which each correspond to a result of a coding operation performed by a transmitter apparatus on a bit stream; a probability generator coupled to said antenna and responsive to said composite communication symbol for generating, for said first and second communication symbols, corresponding first and second pluralities of probabilities that the communication symbol has respective ones of a plurality of possible values of the communication symbol; a combiner coupled to said probability generator for combining said first and second pluralities of probabilities to produce a plurality of combined probabilities; a SISO decoder corresponding to said coding operation and coupled to said combiner for receiving the plurality of combined probabilities and producing therefrom a further plurality of combined probabilities; a splitter coupled between said SISO decoder and said probability generator for receiving said further pluralities of combined probabilities and producing therefrom third and fourth pluralities of probabilities that respectively correspond to said first and second communication symbols; and said probability generator operable for generating said first and second pluralities of probabilities also in response to said fourth and third pluralities of probabilities, respectively.

***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, it is recommended to the applicant to amend all the claims so as to be patentable over the cited prior art of record. A detailed list of pertinent references is included with this Office Action (See Attached "Notice of References Cited" (PTO-892)).
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhanshu C. Pathak whose telephone number is (571)-272-3038. The examiner can normally be reached on M-F: 9am-6pm.
- If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571)-272-3056
  - The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.
  - Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sudhanshu C. Pathak



**STEPHEN CHIN**  
**SUPERVISORY PATENT EXAMINE**  
**TECHNOLOGY CENTER 2800**